

COMPATIBLE PRODUCTS

TEHR LU
TEHR-M-PU

TEHR LU-PU

TEHR-M

TECHNICAL DATA

Supply	24 Vac/dc (22...26 Vac/dc)
Power consumption	24 Vac/Vdc < 1.0 VA
Measuring range (setting by jumpers)	0...+50 °C* 0...+100 °C -50...+50 °C -50...+150 °C
Functions	temperature measurement / controller
Options	P: passive potentiometer (470 Ω, 1 kΩ, 4,7 kΩ, 10 kΩ, 22 kΩ) K5: 5-state switch (5 VA / 0.1 A) K5R: 5-state switch with resistance output
Outputs	1 x 0...10 Vdc, < 2 mA 2 x 0...10 Vdc in TEHR LU-PU model
Communication	Connector for display and ML-SER tool, In TEHR-M and TEHR-M-PU models: RS-485 Modbus/RTU, 9.6*/19.2/38.4/ 56.0 kBd, 8 data bits. Parity none (2 stop bit), parity Even / Odd (1 stop bit)
Accuracy	± 0.5 °C (at +25 °C)
Ambient temperature	0...+50 °C
Housing	IP20, ABS plastic (< 120 °C)
Dimensions	86 x 85 x 32 mm

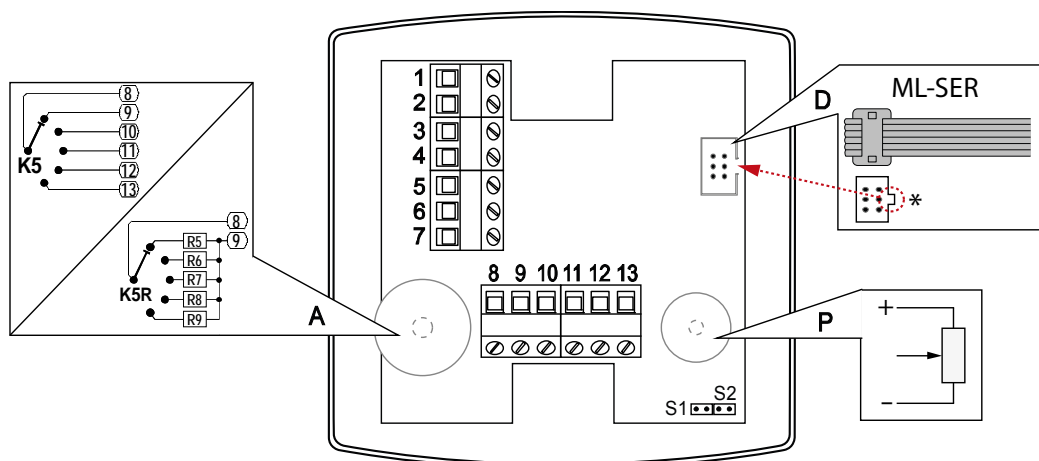
* = Factory setting

ASSEMBLY AND WIRING



Device connection and commissioning can only be carried out by qualified professionals. Always make the connections while the power is switched off.

See a specific fitting instruction for detailed information about the assembly.



1	24 Vac/dc	A	K5 / K5R 5-stage switch (optional)
2	0 V	P	passive potentiometer (optional only in TEHR-LU model)
3	temperature / controller output	D	connector for cover display / ML-SER tool
4	active potentiometer (PU)	S1	temperature measurement range selection
5	potentiometer + / Modbus B-	S2	selection
6	potentiometer slide / Modbus COM	*	from below of the connector
7	potentiometer - / Modbus A+		
8	K5 / K5R selector switch		
9	K5 switch position A / K5R out		
10	K5 switch position 0		
11	K5 switch position 1		
12	K5 switch position 2		
13	K5 switch position 3		

SELECTING MEASURING RANGE

Measuring range can be selected with the jumpers (S4):

* 0...+50 °C	0...+100 °C	-50...+50 °C	-50...+150 °C
S1 S2 ■ ■ ● ●	S1 S2 ■ ■ ■ ■	S1 S2 ● ● ■ ■	S1 S2 ● ● ● ●

* Factory setting.

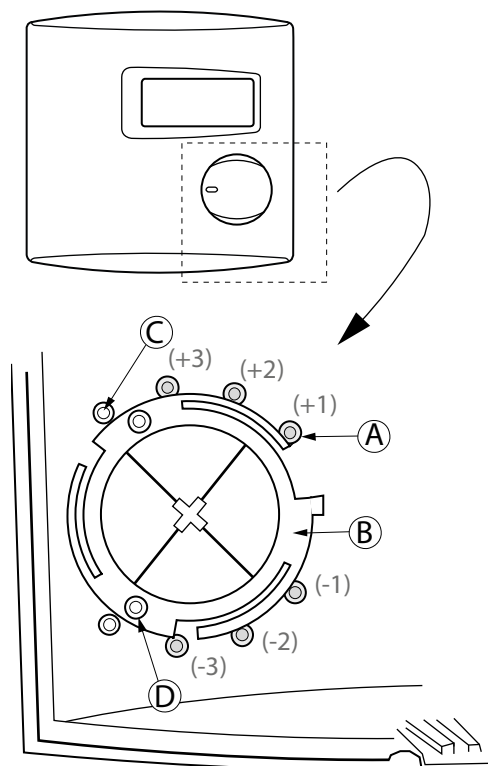
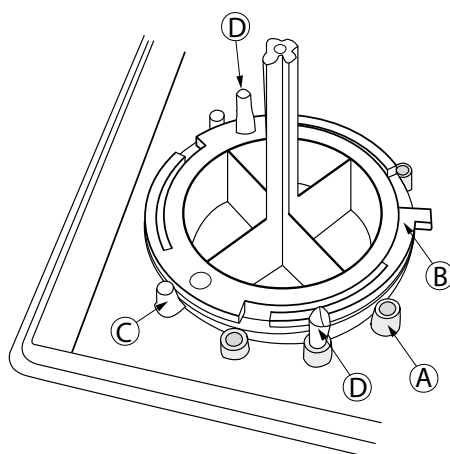
Corresponding signal values at different measurement value range are:

0...+50 °C	0...+100 °C	-50...+50 °C	-50...+150 °C	Signal
0 °C	0 °C	-50 °C	-50 °C	0 V
25 °C	50 °C	0 °C	50 °C	5 V
50 °C	100 °C	50 °C	150 °C	10 V

LIMITING POTENTIOMETER MOVEMENT

The potentiometer knob movement can be limited with the limiting pins.

1. Open the housing of the transmitter.
2. There is two fixed limit pins (C) and two detachable limiting pins (D) for the potentiometer knob (B).
3. Cut off the detachable limiting pin (D) and fix it into limiting hole (A). You can choose from six limiting holes to limit the knob movement.
For example in pictures, the knob movement is limited to -2 °C (temperature transmitter with passive potentiometer).
4. When you have fixed one or two pins (D), put the knob (B) back on its place (in right position).
5. Close the housing.

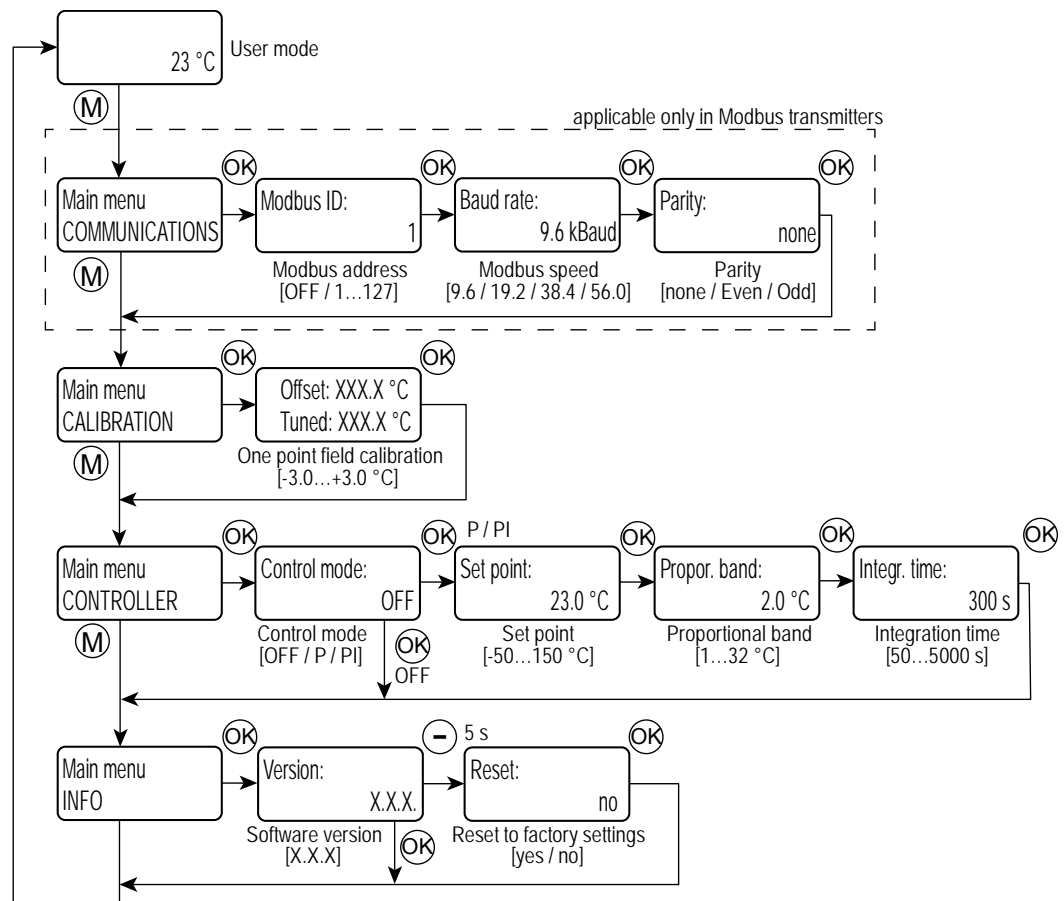


USER MODE

As a default, the temperature shows on the -N model or ML-SER display at 0.1 °C resolution.

MENU

All transmitters settings can be changed by using the ML-SER tool. You can proceed in the menu by pressing the M and OK buttons. The values can be changed with the "+" and "-" buttons. The value is accepted with the OK button. The following menu structure contains the factory settings.



COMMUNICATIONS menu is only available in M-models. Through the menu settings the address, speed and parity of the Modbus transmission can be changed. None parity mode adds two and Even / Odd mode one stop bit to the Modbus message.

CALIBRATION menu is for one point field calibration. The measurement outcome can be tuned ± 3.0 °C by pressing "+" and "-" buttons.

In CONTROLLER menu the voltage output can be changed to controller to control other device in the system.

In INFO menu the software version can be checked and the factory settings can be reset. Reset of the transmitter is available by pressing the "-" button for 5 seconds.

MODBUS

Data type:

bit = 0 or 1
unsigned = unsigned integer (0...65535)
signed = integer (-32768...32767)

Supported Modbus functions

0x01	Read Coils
0x02	Read Discrete Inputs
0x03	Read Holding Registers
0x04	Read Input Registers
0x05	Write Single Coil
0x06	Write Single Register
0x0F	Write Multiple Coils
0x10	Write Multiple Registers
0x17	Read/Write Multiple Registers

Input register (only readable)

Register	Parameter description	Data type	Value	Range
30001	temperature measurement	signed	-500...+1500	-50...+150.0°C
30002	analogue output voltage	unsigned	0...100	0.0...10.0 V
30003	potentiometer position	signed	-30...30	-3.0...3.0°C
30011	temperature measurement (=30001)	signed	-500...+1500	-50...+150.0°C
30013	analogue output voltage (=30002)	unsigned	0...100	0.0...10.0 V

Holding register (readable / writable)

Register	Parameter description	Data type	Value	Range
40001	one point field calibration (offset)	signed	-30...+30	-3.0...3.0°C
40002	control mode	signed	0...2	0 = off 1 = P 2 = PI
40003	set point	signed	-500...+1500	-50.0...150.0°C
40004	proportional band	signed	10...320	1.0...32.0°C
40005	integration time	signed	50...5000	50...5000 s